

UNIVERSITY OF LONDON



POSTGRADUATE MEDICAL SCHOOL OF LONDON

Telegrams
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Department of
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LONDON, W.12

2nd April, 1952.

Dear Cavalli,

I would be very grateful if you could send me your radiation resistant 58-161 strain which shows increased recombination rate. I am anxious to try and determine whether the enhancement effect of UV is secondary to lambda phage liberation, as suggested by Lederberg, or is a primary effect. For this purpose I want a lambda-free 58-161, and it occurred to me that your ~~radiation~~ resistant strain might be suitable, *since one of the ways of selecting ϕ -free strains from lysogenic cultures is to pick radiation-resistant colonies.*

I have done some more experiments since I saw you and think I have now pretty good evidence that the fertility factor (F+) does not simply confer compatibility between otherwise equivalent strains, but that, in fact, "gene donator" strains lack the "Gamete" and therefore are capable of receiving it and that the essential function of F is connected with infection of F- strains with the gamete.

According to the self-compatibility theory, maximum recombination should occur between F+ strains as these strains are already fully compatible. On the other hand F+ x F- matings should, if this theory is correct, occur in two stages: (1) The conversion of the F- strain to F+ and (2) The recombination between the now compatible parents. These matings should therefore be less efficient than F+ x F+ matings.

/According to my theory

According to my theory however, since F- strains consist exclusively of "gene acceptor" cells, matings of these with F+ cells should show maximum recombination. On the other hand since F+ x F+ matings (according to my theory) will depend on the presence of a small number of "gene acceptor" cells in ~~the~~ each population which have spontaneously lost their "gamete" this mating should be minimal.

I have carried out carefully controlled quantitative estimations of the recombination rate with F+ x F+ and F+ x F- mixtures of the same strains under identical conditions and find that the latter combination is about ten to twenty times as efficient as the former.

I don't know whether I have expressed my meaning very clearly in this letter but I hope shortly to send you details of these experiments, as well as of that suggested by yourself on the fertility of F+ x F+ matings when both strains are treated with streptomycin.

Yours sincerely,

Bill Hayes

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